REMARKS

In response to the Office Action dated March 28, 2006, Applicants respectfully request reconsideration and withdrawal of the rejections of the claims.

Claims 13, 16, 18, 21, 23, 24 and 29 were provisionally rejected on grounds of obviousness-type double patenting, in view of claims 23 and 33 of copending Application No. 10/216,928. Since the other application is still in a pending status, and the rejection is only provisional in nature, no formal response is required until allowable subject matter has been identified in the copending application.

As a point of consideration for the Examiner, however, it is noted that the double patenting rejection is based on the assertion that claims 13, 18, 23, 24 and 29 are anticipated by claim 23 of the copending application. Applicants respectfully traverse this assertion. For example, claim 13 recited the step of "providing a metal electrode in direct contact with said dielectric material". Such a step is not recited in claim 23 of the copending application. For at least this reason, therefore, it is respectfully submitted that there is a patentable distinction between the two claims. If the double patenting rejection is not withdrawn, the Examiner is respectfully requested to explain how claim 23 of the copending application is being interpreted relative to this claimed subject matter.

Claims 13-24 and 27-30 were rejected under 35 U.S.C. § 102, on the grounds that they were considered to be anticipated by the Heller et al. patent (US 5,605,662). The Office Action states, among other assertions, that the Heller patent discloses a metal layer in direct contact with a dielectric material. Applicants respectfully traverse this contention. Column 12, lines 55-67 of the Heller patent merely describe the deposition of the metal layer on a layer of insulating substrate materials. Column 13, lines 1-25 merely describe the addition of SiO_2 and Si_3N_4 on the metal layer, noting that the layer is made of SiO_2 and Si_3N_4. This layer is described as performing the function of improving contact and sealing with the aluminum circuitry, and preventing undermining of the circuitry and minimizing reactivity with reagents. See column 13, lines 16-25. In other words, this layer is not an attachment layer on which nucleic acid capture probes can be attached, as recited in the rejected claims. There are further permeation and attachment layers on top of this SiO_2 and Si_3N_4 layer, but these further layers are not in direct contact with a metal electrode.

In responding to Applicants' previous arguments distinguishing the claimed subject matter from the disclosure of the Heller patent, the most recent Office Action seems to suggest that, since there is a permeation layer and this permeation layer is porous, then the two layers sandwiching the permeation layer are in direct contact with each other. It is respectfully submitted that a person of ordinary skill in the art would not consider this to be the case. As long as there is an intermediate layer between the sandwiching layers, they cannot be considered to be in direct contact with one another, regardless of whether the intermediate layer is porous. It is respectfully submitted that, upon a careful and objective reading of the disclosure of the Heller patent, it cannot be considered to anticipate the rejected claims.

Nevertheless, to facilitate the advancement of prosecution, claim 13 has been amended to recite that the step of providing an electrical potential to the electrode causes charge separation in the dielectric layer "without generating a flow of electric current or causing transfer of electrons between said layer and the sample." Similar recitations have been added to claims 18 and 23. In the Heller patent, the system is a closed electric circuit, in which there is a constant flow of electric current or transfers of electrons in the circuit and between the top layer and the sample to be tested. For example, column 5, lines 44-49, suggest the reaction of electrophoresis (or formation of hydrogen gas - $2H^{+}+e^{-} \rightarrow H_{2(g)}$), indicating the transfer of electrons in the system. Column 6, lines 46-51 describe that "Each microscopic location contains an underlying working *direct current (DC)* micro-electrode supported by a substrate...", suggesting that there is a flow of current in the system. Column 7, lines 9-12 again describe that an "underlying microelectrode at each micro-location continues to function in a *direct current (DC)* mode...." There are other examples in the Heller patent indicating the transfer of electrons or flow of electric current in the system.

Accordingly, it is respectfully submitted that claims 13, 18 and 23, as amended, are patentably distinct from the Heller patent. In support of the amendment, Figure 3 of the present application shows that the system is provided with a grounded end, meaning that the electric circuit of the system, or the method carried out in performing the hybridization with the system, is an open circuit. The grounding of the circuit necessarily prevents the flow of electric current in the open circuit, or the transfer of electrons from taking place between the dielectric attachment layer and the sample to be tested. Further support can be found at least on page 8, lines 14-17, in which it is described that "there is no electron transfer between the sample solution and the surface of the dielectric layer."

Claim 31 was rejected under 35 U.S.C. § 103, as being unpatentable over the Heller patent in view of the Gerdes et al. patent (US 6,291,166). It is respectfully submitted that these references actually teach away from the subject matter of the claims. The Heller patent discloses a system in which, in use, there is formation of electrolysis gases, such as oxygen and hydrogen. See, for example, column 13, lines 41-46. In the method of the currently pending claims, no electrolysis takes place. For instance, page 8, lines 14-18 of the present application indicate the undesirability of a system in which electrolysis does take place. Contrary to the system in the Heller patent, the claimed method provides an unexpected advantage, in that there is no undesirable change of salt concentration or pH value, or the formation of bubbles or precipitation in use, due to the lack of electrolysis or any side chemical reactions taking place. Applicants would like to note that they have tested the system of the Heller patent, and found out, among other things, that the electrode became burnt quite easily.

The dielectric attachment layer of the claimed method essentially serves as a capacitor for assisting hybridization of nucleic acid. A capacitor is defined as a device that stores energy in the electric field created between a pair of conductors on which electric charges of equal magnitude, but opposite sign, have been placed. In the system described in the Heller patent, none of the layers acts as a capacitor in use.

New claims 32-34 further specify that the dielectric attachment layer is impermeable. This feature is the opposite of the teaching of the Heller patent, which specifically requires the layer to be porous to allow diffusion to occur. See column 13, lines 47-49. The Heller patent teaches against the use of an impermeable layer.

Accordingly, it is respectfully submitted that the Heller patent, whether considered by itself or in combination with the Gerdes patent, does not teach the claimed subject matter.

Claims 13, 15, 16, 18, 20, 21, 23, 24 and 29 were provisionally rejected under 35 U.S.C. § 102, on the basis of the above-noted copending application. Since this rejection is only provisional in nature, it is believed that no response is required at this time. Again, however, for the reasons presented above in connection with the double patenting rejection, Applicants submit that the subject matter of the currently pending claims is patentably distinct from the copending application. In this regard, it is noted that the statement of rejection omits the claimed step of providing a metal electrode in direct contact with the dielectric material. As such, the Office Action does not provide the requisite showing that is needed to support a rejection of anticipation.

Reconsideration and withdrawal of the rejections, and allowance of all pending claims under consideration are respectfully requested.

Respectfully submitted,

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